

Preliminary Amendment

Applicant: Jeffrey W. Chambers

Serial No.: 10/064,498

Filing Date: July 22, 2002

Docket No.: C364.104.101

Title: CATHETER WITH FLEXIBLE TIP AND SHAPE RETENTION

IN THE CLAIMS

Please cancel claims 18-24.

Please add newly presented claims 33-39 and amend claims 1, 2, 11-15, and 25 as follows:

- 1.(Currently Amended) A-The guide catheter of claim 33, wherein:
~~generally flexible to conform to vascular areas of a body for use with a variable stiffness guidewire, comprising:~~
said catheter extending from a proximal end to a distal end;
said catheter having a lumen therein, the lumen sized to receive the guidewire therein;
the curved shape of the distal tip defines a curvature ~~said catheter having a pre-formed curved portion in its distal end (curved distal tip) of ninety degrees or greater;~~
~~the curved distal tip rotatable to different orientations by rotations of the proximal end of the catheter; and~~
the curved distal tip having
a flexibility to permit straightening of the curved distal tip by advancing the guidewire therethrough; and
shape retention memory to return to the original angle of curvature.
- 2.(Currently Amended) The catheter of claim 1, wherein the ~~proximal end to the distal end forms a first section, the pre-formed curved distal tip portion is less~~ more flexible than the ~~first intermediate~~ section.
- 3.(Original) The catheter of claim 1, wherein the curved distal tip includes a first straight subsection, a pre-formed curved subsection, and a second straight subsection.
- 4.(Original) The catheter of claim 1, wherein the curved distal tip includes a straight subsection and a pre-formed curved subsection.

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5.(Original) The catheter of claim 1, wherein the curved distal tip includes a pre-formed curved subsection and a straight subsection.

6.(Original) The catheter of claim 3, wherein a bending stiffness of the straight subsection is greater than a bending stiffness of the pre-formed curved subsection.

7.(Original) The catheter of claim 4, wherein a bending stiffness of the straight subsection is greater than a bending stiffness of the pre-formed curved subsection.

8.(Original) The catheter of claim 5, wherein a bending stiffness of the straight subsection is greater than a bending stiffness of the pre-formed curved subsection.

9.(Original) The catheter of claim 3, wherein the pre-formed curved subsection is disposed between the first straight subsection and the second straight subsection.

10.(Original) The catheter of claim 1, wherein an amount of curvature of the curved distal tip can be controlled by a variable stiffness guidewire.

11.(Currently Amended) The catheter of claim 1, wherein the ~~pre-formed curved portion~~ distal tip is formed of fused nylon.

12.(Currently Amended) The catheter of claim 1, wherein the ~~pre-formed curved portion~~ distal tip is formed of plastic.

13.(Currently Amended) The catheter of claim 1, wherein the ~~pre-formed curved portion~~ distal tip is formed of polyurethane.

14.(Currently Amended) The catheter of claim 1, wherein the ~~pre-formed curved portion~~ distal tip includes a wire having shape memory characteristics.

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15.(Currently Amended) The catheter of claim 1, wherein the ~~pre-formed curved portion~~ proximal section includes a double braided metal member.

16.(Original) A catheter generally flexible to conform to vascular areas of a body, comprising:
said catheter extending from a proximal end to a distal end and having an intermediate section therebetween;
a variable stiffness guidewire slidably disposable within a lumen of the catheter, the guidewire having a guidewire proximal end and extending to a guidewire distal end;
the lumen sized to receive the guidewire therein;
the catheter having a pre-formed curved portion in its distal end (curved distal tip);
the curved distal tip rotatable to different orientations by rotations of the proximal end of the catheter; and
the curved distal tip having a flexibility to permit straightening of the curved distal tip by sliding the guidewire relative to the catheter.

17.(Original) The catheter of claim 16, wherein the guidewire has a variable stiffness near the distal end with decreasing stiffness toward a distal tip of the guidewire.

18. – 24.(Cancelled).

25.(Currently Amended) ~~A—The method of claim 39, wherein for catheterizing body passages, comprising the steps of:~~

~~introducing a variable stiffness guidewire into a body passage, the guidewire having a guidewire proximal end and a guidewire distal end;~~
~~disposing a lumen of a catheter over the variable stiffness guidewire, the catheter generally flexible to conform to vasculature of a body, the catheter extending from a proximal end to a distal end and having an intermediate portion~~

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therebetween, the catheter having a pre-formed curved portion in ~~its distal end~~ the
(curved distal tip), the curved portion having a flexibility to permit straightening
of the curved distal tip by sliding the guidewire relative to the catheter; and
wherein manipulating the catheter to form the curved shape includes:

slidably adjusting the variable stiffness guidewire relative to the catheter and
straightening the pre-formed curved portion. and;
~~introducing the guidewire and catheter into a body passage;~~
~~advancing the catheter and guidewire through the body passage to an entrance of~~
~~a first branched passageway;~~
withdrawing the guidewire into the catheter allowing the ~~eatheters~~ curved distal
tip to resume ~~its~~ the pre-formed angle of curvature;
~~advancing the guidewire and using the plurality of forces the desired angle of curvature~~
~~of the curved distal tip of the catheter can be created, thereby allowing the~~
~~guidewire to be advanced into the first branched passageway; and~~
~~cannulating successively branched passageways by cooperatively manipulating and~~
~~slidably adjusting the relative position of the guidewire and catheter from the~~
~~exterior of the body until the desired body passageway is reached.~~

26.(Original) The method of claim 25, further comprising the steps of:

rotating the proximal end of the catheter to rotate the distal tip to different orientation,
and
advancing further the guidewire and catheter.

27.(Original) The method of claim 25, further comprising the step of administering medication
through the catheter.

28.(Original) The method of claim 25, further comprising the steps of removing the catheter
and advancing an angioplasty balloon over the guidewire.

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29.(Original) The method of claim 25, further comprising the steps of removing the catheter and advancing a stent over the guidewire.

30.(Original) The method of claim 25, further comprising removing the guidewire.

31.(Original) A catheter for use in combination with a variable stiffness guidewire, comprising:
a longitudinal axis, a proximal section and a distal section;
said distal section comprising a soft flexible pre-formed curved portion in its distal end
having a curvature of ninety degrees or greater and shape retention properties;
said catheter having
an inner wall that defines a lumen that runs along said longitudinal axis forming a
single continuous tube, a reinforcement braid disposed over said inner
wall, and
an outside covering disposed over said reinforcement braid;
said catheter proximal end further comprising a spacer disposed between said wall
liner and said reinforcement braid; and
said reinforcement braid doubled over the proximately two-thirds of the catheter.

32.(Original) A catheter for use with a variable stiffness guidewire with a pre-formed curved distal tip, comprising:
said catheter generally flexible to conform to vascular areas of a body,
said catheter extending from a proximal end to a distal end;
said catheter having a lumen therein, the lumen sized to receive a guidewire therein;
the distal tip rotatable to different orientations by rotations of the proximal end of the
catheter; and
the distal tip having flexibility to permit bending of the distal tip by advancing the
variable stiffness guidewire therethrough.

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33.(New) A guide catheter for steering a guidewire from a first body passage to a second, branched body passage having a diameter of not more than 4 mm, the guide catheter comprising:

a catheter body defining a lumen; and

a reinforcement braid extending along the catheter body;

wherein the catheter defines:

a proximal section,

an intermediate section extending from the proximal section and defining a longitudinal axis,

a distal section extending from the intermediate section and forming a distal tip having an outer diameter sized for deployment within a body passage having a diameter of not more than 4 mm and capable of maintaining a curved shape relative to the longitudinal axis;

and further wherein in the curved shape, the distal tip is configured to steer a guide wire from a first body passage to a second, branched body passage extending at an angle from the first body passage.

34.(New) The guide catheter of claim 1, wherein the catheter is configured to independently maintain the curved shape at the distal tip.

35.(New) The guide catheter of claim 33, wherein the catheter is configured such that a spatial orientation of the distal section, in the curved shape, can be altered by rotating the proximal section.

36.(New) The guide catheter of claim 33, wherein the lumen at the distal section has a diameter appropriate for steering a guidewire having a diameter of approximately 0.014 inch.

37.(New) The guide catheter of claim 33, wherein the lumen at the distal section has a diameter of approximately 0.017 inch.

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38.(New) The guide catheter of claim 33, wherein an outer diameter of the distal section is approximately 0.029 inch.

39.(New) A method for steering a guide wire within bodily passages of a patient, the method comprising:

introducing a variable stiffness guidewire into a first body passage;

targeting a branch body passage having a diameter of not more than 4 mm and extending from the first body passage at an angle;

deploying a guide catheter over the guidewire such that a distal section of the guide catheter is adjacent the branch passage;

manipulating the guide catheter such that a distal tip portion of the distal section forms a curved shape;

further manipulating the guide catheter such that a distal end of the curved distal tip faces the branch body passage;

distally advancing the guidewire such that the curved distal tip steers the guidewire into the branch body passage; and

advancing the guide catheter over the guidewire and into the branch body passage.